



SEMICONDUCTOR DEVICE

CROSS REFERENCE TO RELATED APPLICATION

This application claims priority from Japanese  
5 Priority Document No. 2002-225631, filed on Aug. 2, 2002 with  
the Japanese Patent Office, which document is hereby  
incorporated by reference.

BACKGROUND OF THE INVENTION

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[0001]

1. FIELD OF THE INVENTION

The present invention relates generally to a  
semiconductor device, and more particularly, to a  
15 heterojunction bipolar transistor.

[0002]

2. DESCRIPTION OF RELATED ART

A heterojunction bipolar transistor (hereinafter  
referred to as a HBT) is a kind of bipolar transistor having  
20 an emitter layer made of a material with a wider band gap than  
a material of a base layer, in which high injection efficiency  
(emitter injection efficiency) of electrons from the emitter  
layer to the base layer can be assured even when the base layer  
has an impurity concentration higher than the emitter layer.  
25 Thus, the base layer can have low resistance even with a  
reduced thickness, and a punch-through phenomenon across the  
base layer can be prevented to ensure a high emitter-collector  
breakdown voltage. Basically, the HBT is an excellent device  
which achieves fast operation and the high breakdown voltage.

30 [0003]

The HBT is favorable for use as a device for a power